actors to the patch test reacted to PPD second strength intradermal, a total of 79 or 7.5 per cent reactors in this group. Among those students who had previously had a tuberculin test but had not reacted, 469 were tested. Of these, 5 or 1.1 per cent reacted to the patch test, and 15 or 13.2 per cent nonreactors to the patch test reacted to PPD second strength intradermal, a total of 20 or 4.3 per cent reactors in this group. Again we know only that this group had had previous tests some time one year or longer previously.

If we consider all reactors as 100 per cent, and consider by percentage the fraction not discovered by the patch test but discovered by the PPD second strength intradermal test, or patch test failures, we have a comparison as indicated in Table 2.

IN CONCLUSION

We have separated the results of the Wolff percutaneous patch tests from those of the Vollmer test, not for the purpose of comparing the two tests, but simply because different materials were used. Our conclusions are that the patch test, as a means of finding tuberculin reactors among school children, is a highly desirable form of "first test," since it eliminates the use of one of two intradermal tests—in themselves disadvantageous because of the fear of the child of the "needle," and because of the remote but possible chance of infection. The patch test has an added advantage in not necessitating physician-time in its application, since it can easily be applied by the nurse or by any responsible person. However, because of the 25 to 50 per cent failure of the patch test to pick out reactors to tuberculin, it can be used only as a "first test" and should never be relied upon wholly as a means of finding the tuberculin reacting individual. It is to be urged that widespread effort should be given to instructing the medical profession against using only the patch test as the means of finding the tuberculin reactor.

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PATCH TEST: ITS EVALUATION *

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IN the N. T. A. *Bulletin* of March, 1940, Dr. Hermann Vollmer stated: "Case finding means the discovery of persons with tuberculous lesions not yet arrested, rather than finding of positive reactors to tuberculin." I would reword this statement by saying: "Case finding means the discovery of persons with unknown tuberculous lesions regardless of status (active, quiescent or arrested); that the most fruitful method of discovering active cases or spreaders of disease is by tuberculin-testing our school children and completing the family follow-up on all contacts to reactors."

As you can judge from Doctor Verbarg's discussion of the literature, there are many conflicting reports regarding the efficiency of the patch test versus the Mantoux test. Early reports were more enthusiastic about the patch test than are more recent reports. Early use of the patch test was in cases of clinical or known active tuberculosis. In such cases the test was 99+ per cent as reliable as the O. T. or PPD intracutaneous tests. Three years ago we tested our patients in the Santa Clara County Sanatorium with both patch test and 1:10,000 O. T., and found the conformity of the two to be 98.8 per cent. There were 129 persons who were tested.

It has since been generally shown that the patch test is not as efficient as the Mantoux in persons with a low sensitivity to tuberculin. Most recent reports have concluded that the patch is as efficient as PPD first strength, and is a satisfactory screening first test; but all negatives should be retested with PPD second strength. This is the conclusion reached from the study of the two tests in the San Jose schools.

It seems to me that Doctors Vollmer and Goldberger,[1] two of the most ardent supporters of patch-testing, have delegated the patch test to its proper place when they state: "It seems that the Mantoux with 0.1 mg. O. T. or less, or with first strength solution of PPD can be replaced by the tuberculin patch test. A routine is suggested for tuberculin testing, the tuberculin patch test being proposed as the first test."

There are some who are advocating routine fluoroscopy or fluorography of all school children without tuberculin testing. This type of program is better than nothing, but it is quite inadequate when you consider that fluoroscopy or even x-ray exam-

* Read before the California Tuberculosis Association, Fresno, April 7, 1943.

ination in school children will reveal on the average from .2 to 1 per cent positive chests, while tuberculin testing will reveal an average of from 10 to 25 per cent reactors, thus giving a much larger field for case finding or search for spreaders of disease. There is no doubt but that routine fluoroscopy, fluorography, or x-ray have their place in case finding among adults, especially in our armed service, industry and the general hospital clinics. There can also be no doubt but that the most adequate case-finding program in our schools depends upon screening the reactors, x-raying some and making a complete follow-up of the families to locate the spreaders.

In Santa Clara County, from May, 1940, to May, 1942, 533 x-rays were taken on contacts to reactors in school surveys. Among this group 32 active or suspicious cases were found. Of these only two persons or .3 per cent were in the age group under 18; 6.4 per cent were 18 or over. The discovery of these 32 cases represents the fruit of our school survey and family follow-up.

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COMMUNITY EXPERIENCE *

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Santa Rosa

THE war has not confronted us with the tremendous case-finding problems created by the influx of persons into communities in which there are large war industries.

Rather, it is our problem to continue intensifying the program of tuberculosis control among our somewhat stable population.

Sonoma County is a comparatively rural community with a population of 70,000 in the 1940 census. It is probable there has been an increase of five thousand since the onset of the war. The northern portion of the county is mainly agricultural. Here we are confronted with a transient population in the fruit-picking season. The southern part of the county is confined largely to dairying and the poultry industry. In this area we find a rather stable population.

SONOMA COUNTY ENVIRONMENT

There are six incorporated communities in the county. Santa Rosa, in which the Sanatorium is located, is near the center of the county, and is surrounded by the other communities at a distance of from seven to twenty miles. It is this central location of Santa Rosa upon which our entire program is based.

We have another asset in what we are pleased to call a "unified" Health Department. By that I mean that the medical and health set-up are under the direction of one person who is Director of Health of this unified system, and who is also our acting health officer for the duration. By having this unified system we are able to coördinate our case-finding programs in the acute hospital and its out-patient clinics; the Health Department and its various clinics with the tuberculosis hospital and its case-finding projects. In the present set-up we have two assistant health officers, one of whom is in charge of venereal disease control throughout the county, and the other is in charge of the entire tuberculosis program. Our five public health nurses work in the various clinics, under the direction of the three health officers. Consequently, they have first-hand information of the persons attending the clinics, and therefore receive complete instructions on the procedure to follow regarding the care and follow-up of any given patient.

RÔLE OF SONOMA TUBERCULOSIS ASSOCIATION

Our Tuberculosis Association is dovetailed into the program very closely, and it is consulted or directed, as the case may be, regarding all problems in tuberculosis control that arise throughout the county.

Originally, all of our work was done through a biweekly diagnostic and follow-up clinic held at the Sanatorium. Discharged sanatorium patients, contacts, and known arrested cases of tuberculosis were followed in these clinics. It was necessary for patients or children with positive skin tests and their families in all parts of the county to go to the clinics in Santa Rosa. But war made it necessary for us to alter this situation. Consequently, last summer the Tuberculosis Association provided us with a portable fluoroscope. Clinics are still continued at the Sanatorium for the follow-up of our out-patients and for those persons in the Santa Rosa area. We have added to this schedule a fluoroscopic clinic one night each month in the major communities. These clinics have only recently been established; they are entirely voluntary and are arranged by the executive secretary of the Tuberculosis Association. A skin-testing program is continued, not because of the number of cases of tuberculosis found, but rather because the opportunity is maintained to get literature and our public health nurses into many homes. We also skin-test all prenatal cases, as well as all children admitted to our pediatric wards.

We are coöperating closely with the Medical Corps of the induction center of the United States Army. Information is reported regarding possible cases of tuberculosis in any inductee from our county. These persons are promptly contacted by our health nurses and brought into our clinics. Through this method we have seen several persons with evidence of arrested disease. These we continue to follow in our clinics. From this source we have found three cases of active pulmonary tuberculosis.

Following the recent fluoroscopic survey at the Basalt Rock Company in Napa County, we were given forty-one names of workers residing in our county; twenty-six of these had reference to their

* From Oak Knoll Sanatorium, Santa Rosa.

Synopsis of a paper read before the California Trudeau Society and the California Tuberculosis Association, Fresno, April 7, 1943, in symposium on "War-Time Tuberculosis Case Finding."